

- QUICK TESTER FOR TRANSFORMERS AND CAPACITORS

# 8505



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# 1. INTRODUCTION

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## 1.1 Receiving Your Shipment

Upon receiving your shipment, make sure that the contents are consistent with the packing list. Notify your distributor of any missing items. If the equipment appears to be damaged, file a claim immediately with the carrier and notify your distributor at once, giving a detailed description of any damage. Save the damaged packing container to substantiate your claim.

## 1.2 Ordering Information

**Quick Tester Model 8505..... Cat. #2136.51**

*Includes a soft carrying case, probe, two alligator clips and a user manual.*

### 1.2.1 Replacement Parts

Soft Carrying Case ..... **Cat. #2139.72**

Probe ..... **Cat. #5000.70**

One Black Alligator Clip ..... **Cat. #5000.71**

**Order Accessories and Replacement Parts Directly Online**  
*Check our Storefront at [www.aemc.com](http://www.aemc.com) for availability*

### 1.3 Introducing the Quick Tester Model 8505

The AEMC® Quick Tester Model 8505 is a hand-held instrument for performing quick basic integrity tests on transformers and capacitors used by electrical utilities. This instrument is a fast and inexpensive inspection tool for detecting opens or shorts caused by shipping damage or workmanship issues, and for verifying the proper operation of switching components.

The Model 8505 verifies transformers with functional coils without requiring a full transformer ratio test. A single user can check a shipment of incoming transformers; units that have a defective coil or switch can be quickly pinpointed and turned around for repair. The instrument provides simple, single-button operation; the user only needs to make the proper connections and push a button. Test results are clearly indicated by bright LEDs and (when applicable) a buzzer. The instrument includes captive cables with safety clips, test probe, and a built-in fuse for protection; and operates on four AA batteries. It also automatically detects whether or not the unit under test is a transformer or a capacitor.



The Model 8505 features internal multi-frequency ACV source and loads to accommodate the testing of a wide range of transformers and capacitors. Its microprocessor-based design provides a high level of control, stability, and repeatability. Other Model 8505 features include built-in self-test components, fuse protection, and an indicator providing ample warning for low battery. Typical users include electrical utility maintenance and management personnel at electrical utility supply and transformer repair facilities. For instance, electrical utility staff can use

the Model 8505 to test an incoming shipment of transformers from the manufacturer to determine whether or not to accept the shipment or send it back due to damage. The Model 8505 can similarly test phase compensation capacitors for basic operation.

The Model 8505 comes with a probe, two alligator clips, and a carrying pouch (see the illustration on the previous page). The probe and the alligator clip are threaded and must be screwed on to the cable.

The Quick Tester Model 8505 is a companion product to AEMC's DTR® Model 8510 transformer tester. The Model 8505 differs from the Model 8510 in that the Model 8510 provides more detailed information about the unit under test, but requires more time to set up and obtain results. For example, the Model 8505 can determine whether or not to accept or reject the incoming transformer; the Model 8510 is then used when the transformer is subsequently set up and installed for operation.

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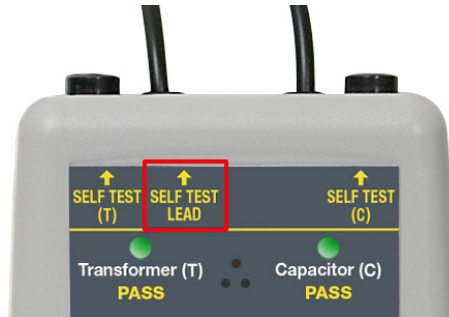
## 2. OPERATION

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### 2.1 Performing a Self-Test

Before using the Model 8505, perform a short series of self-tests to ensure the instrument is functioning properly.

1. Locate the Model 8505 SELF TEST LEAD, labeled at the top of the instrument's front panel.



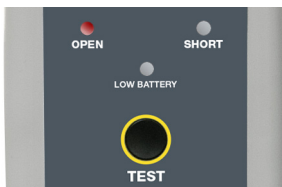
2. Attach the probe to the SELF TEST LEAD by inserting the lead into the probe. Screw the probe into the cable.



3. Attach one of the alligator clips to the other (unlabeled) lead.

4. With the probe and clip separated, press the TEST button in the center of the Model 8505 front panel.

The red OPEN light should blink while the button is depressed. Release the button.



5. Connect the alligator clip to the probe tip, and press the TEST button again. The red SHORT light should blink while you hold down the button.
6. Separate the probe from the clip. Insert the tip of the probe into the terminal labeled SELF TEST (T), and then press the TEST button. The green Transformer (T) PASS light should blink, and the buzzer should emit a steady sound.



7. Insert the probe into the terminal labeled SELF TEST (C), and press TEST. The green Capacitor (C) PASS light should blink, and the buzzer should sound.

If any of the preceding tests fail to produce the response described above, return the instrument to AEMC® for repair.

## 2.2 Testing Transformers and Capacitors

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**Before performing a test on a capacitor or transformer, ensure it is fully de-energized. Testing an energized transformer or capacitor is a potential shock hazard to the user and may damage the Model 8505.**

**When using the Model 8505 to check the secondary side of transformers, note that high voltage may be present on the primary side. Be sure to avoid any contact with primary-side connections that have not been fully de-energized.**

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The Model 8505 is designed for testing the integrity of transformers and capacitors used in the power industry.

With the Model 8505, you can test:

- Transformers that have newly arrived at your facility. During transport, vibration and shock can result in the transformer coils to short, open, or disconnect from the terminals. Although it's possible for a transformer turn ratio meter to test for integrity, this type of instrument requires more time and labor to set up, connect to the transformer, and perform the test. The Model 8505 can perform a very quick and simple integrity test, enabling you to test multiple transformers in a short amount of time.
- A transformer transported back to the repair facility. You can use the Model 8505 to ensure that the basic continuity of all the coils is intact before performing more detailed tests.
- Capacitor terminals or plates that may be damaged. The Model 8505 can quickly determine whether or not a capacitor is still functioning to determine whether more detailed tests and repairs are necessary.

Note that if a transformer coil is partially damaged – for instance, some internal turns have shorted but there is continuity as a coil – or if a capacitor is partially damaged but is still functioning as a capacitor, the Model 8505 will not detect an error. (A turn-ratio meter or a winding resistance meter would be a more effective instrument for detecting this condition.)



## 2.2.1 Performing a Test

Testing a transformer or capacitor is very simple and straightforward.

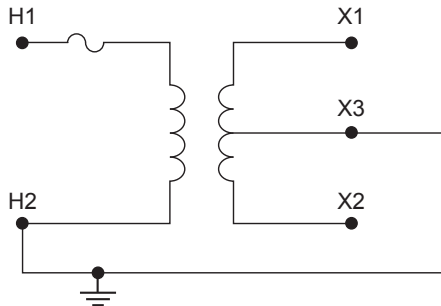
- To test a transformer, connect the alligator clip to one end terminal of the transformer's coil and touch the probe to the other end terminal of the coil. If there is continuity, the green Transformer (T) PASS light will blink and the buzzer will sound. If the coil is open, the red OPEN light will blink, and no buzzer sounds. Note that you can test both single-phase and three-phase transformers, as explained in detail later in this section.
- To test a capacitor, connect the alligator clip to one terminal and touch the probe to the other terminal. If the capacitor is functional, the green Capacitor (C) PASS light blinks and the buzzer sounds. If the capacitor is shorted, the red SHORT light blinks and no buzzer sounds.

## 2.2.2 Testing a Single-Phase Transformer

In single-phase power transformers, the primary coil(s) are accessible over the insulators (bushings); the secondary coil(s) are more easily accessible over the tank. When a coil is checked, the green Transformer (T) PASS blinks and the buzzer sounds if the coil is functioning. Note that you should disconnect the fuse on the primary side while checking the integrity of the secondary coils.

To test a single-phase transformer, connect the Model 8505 probe to the SELF TEST LEAD and the alligator clip to the other unlabeled lead. Then proceed as follows:

1. Attach the alligator clip to one end terminal of the primary and touch the other end terminal with the probe. In the diagram below, the terminals of the primary coil are labeled H1 and H2.



If the coil is functioning the green Transformer (T) PASS light blinks and the buzzer sounds.

2. Connect the alligator clip to one terminal of the secondary and touch the other terminal with the probe. The secondary coil terminals are labeled X1, X2, and (for transformers with center-tapped terminals) X3. If the secondary is not center-tapped, test across X1 and X2. If it is center-tapped, also test across X1 and X3, and X2 and X3.



In each test, if the coil is functioning the green Transformer (T) PASS light blinks and the buzzer sounds. (Note that this center tap is sometimes switched in and out.)

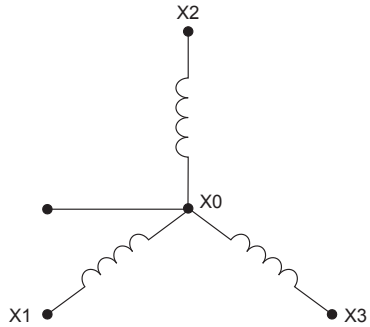
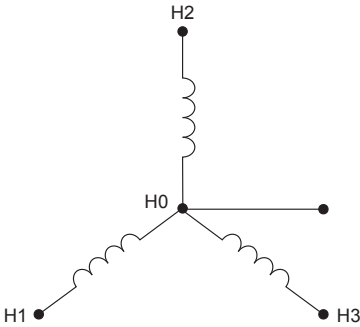
3. If one end of the primary and the center-tapped terminal of the secondary are connected to the tank (which is solidly earth-grounded in normal operation), check across H2 to tank and X3 to tank. In both tests, the red SHORT light should blink.

If any of the preceding tests encounter a problem, the red OPEN light blinks to indicate the test failed.

### 2.2.3 Testing a Three-Phase Transformer

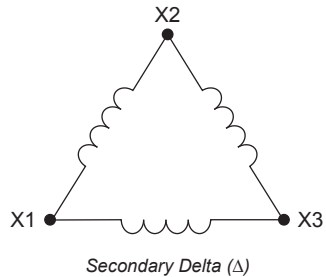
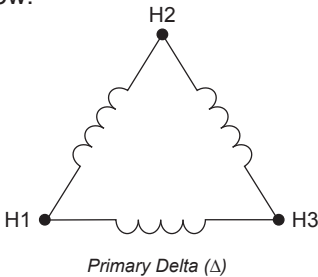
Three-phase transformers can have many different configurations. The two most common configurations are Y (wye), with each phase connected to neutral; and Delta ( $\Delta$ ), with each phase connected to the other two phases.

The following diagram shows the typical three-phase transformer access points for primary Y (left) and secondary Y (right) configurations.



For Y configurations, you must measure from each phase to neutral and from each phase to other phases.

A typical Delta configuration for a three-phase transformer is shown below:



For Delta configurations, you must measure from each phase to other phases. Note that in this configuration, if one coil is open, the Model 8505 can still perform tests because the other two coils may be intact and there is a complete pathway.

The following table lists the expected results reported by the Model 8505 testing across pairs of terminals in Y and Delta transformer configurations.

Measurement terminals	Result if coil is good (indicator light blinks)*	Comments
X1 to X0	Transformer (T) PASS	
X2 to X0	Transformer (T) PASS	
X3 to X0	Transformer (T) PASS	
X1 to X2	Transformer (T) PASS	
X2 to X3	Transformer (T) PASS	
X3 to X1	Transformer (T) PASS	
H1 to H2	Transformer (T) PASS	
H2 to H3	Transformer (T) PASS	
H3 to H1	Transformer (T) PASS	
H1 to H0	Transformer (T) PASS	
H2 to H0	Transformer (T) PASS	
H3 to H0	Transformer (T) PASS	
H1 to X1	Transformer (T) PASS	If H0 and X0 are connected to each other
	OPEN	If H0 and X0 are not connected together
H2 to X2	Transformer (T) PASS	If H0 and X0 are connected to each other
	OPEN	If H0 and X0 are not connected together
H3 to X3	Transformer (T) PASS	If H0 and X0 are connected to each other
	OPEN	If H0 and X0 are not connected together
H0 to X0	SHORT	If H0 and X0 are connected to each other
	OPEN	If H0 and X0 are not connected together

\*The buzzer sounds when the Transformer (T) PASS light blinks.

Note that if the Delta configured transformer is primary with a neutral (H0), and if the secondary Y has a neutral (X0), they may be shorted in some configurations.

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## 3. SPECIFICATIONS

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ELECTRICAL	
Short	$<20\Omega$
Open	$>20\Omega$
Transformer	$>1\text{mH}$
Capacitor	$0.5\mu\text{F}; <1\text{mF}$
Power Source	4 x 1.5V AA (LR6) Alkaline batteries
Battery Life	More than 2500 ten second tests on a full charge
Low Battery Indicator	Red LED blinks; approximately 100 tests can be conducted when LED starts to blink
MECHANICAL	
Dimensions	7.2" x 3.65" x 1.26" (182.9 x 92.7 x 32mm) w/o leads
Weight (with battery)	14.4 oz. (408 grams)
Case	UL94
Vibration	IEC 68-2-6 (1.5mm, 10 to 55Hz)
Shock	IEC 68-2-6 (1.5mm 10 to 55Hz)
Drop	IEC 68-2-32 (1m)
ENVIRONMENTAL	
Operating Temperature	14° to 122°F (-10° to 50°C)
Storage Temperature	-4° to 140°F (-20° to 60°C)
Relative Humidity	0 to 85% @ 95°F (35°C), non-condensing
Altitude	2000m
SAFETY	
Safety Rating	50V CAT IV
Environmental	IP30

Reference Conditions: 23°C  $\pm$  3°C, 30 to 50% RH, battery voltage: 6V  $\pm$  10%.

\*Specifications are subject to change without notice

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## 4. MAINTENANCE

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### 4.1 Cleaning



**Disconnect anything connected to the device.**

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- Use a soft cloth lightly moistened with soapy water. Wipe with a moist cloth and then completely dry with a dry cloth.
- Never use alcohol, solvents or hydrocarbons.

### 4.2 Repair

**Ship To:** Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments  
15 Faraday Drive  
Dover, NH 03820 USA  
Phone: (800) 945-2362 or (603) 749-6434 (Ext. 360)  
Fax: (603) 742-2346 or (603) 749-6309  
E-mail: [repair@aemc.com](mailto:repair@aemc.com)

**NOTE: You must obtain a CSA# before returning any instrument.**

Costs for repair, standard calibration, and calibration traceable to N.I.S.T. are available.

### 4.3 Technical and Sales Assistance

If you are experiencing any technical problems, or require any assistance with the proper operation or application of your instrument, please call, mail, fax or e-mail our technical support team:

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments  
200 Foxborough Boulevard  
Foxborough, MA 02035 USA  
Phone: (800) 343-1391 or (508) 698-2115  
Fax: (508) 698-2118  
E-mail: [techsupport@aemc.com](mailto:techsupport@aemc.com)

**NOTE: Do not ship Instruments to our Foxborough, MA address.**

## 4.4 Limited Warranty

The Quick Tester Model 8505 is warranted to the owner for a period of one year from the date of original purchase against defects in manufacture. This limited warranty is given by AEMC® Instruments, not by the distributor from whom it was purchased. This warranty is void if the unit has been tampered with or abused, or if the defect is related to service not performed by AEMC® Instruments.

Full warranty coverage and product registration is available on our website at [www.aemc.com/warranty.html](http://www.aemc.com/warranty.html).

Please print the online Warranty Coverage Information for your records.

### What AEMC® Instruments will do:

If a malfunction occurs within the one-year period, you may return the instrument to us for repair, provided we have your warranty registration information on file or a proof of purchase. AEMC® Instruments will, at its option, repair or replace the faulty material.

**REGISTER ONLINE AT: [www.aemc.com](http://www.aemc.com)**

## 4.5 Warranty Repairs

What you must do to return an Instrument for Warranty Repair:

First, request a Customer Service Authorization Number (CSA#) by phone or by fax from our Service Department (see address below), then return the instrument along with the signed CSA Form. Please write the CSA# on the outside of the shipping container. Return the instrument, postage or shipment pre-paid to:

**Ship To:** Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments

15 Faraday Drive

Dover, NH 03820 USA

Phone: (800) 945-2362 or (603) 749-6434 (Ext. 360)

Fax: (603) 742-2346 or (603) 749-6309

E-mail: [repair@aemc.com](mailto:repair@aemc.com)

**Caution:** To protect yourself against in-transit loss, we recommend you insure your returned material.

**NOTE:** You must obtain a CSA# before returning any instrument.



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